

Analysis of Regional Disparity Among Regencies/Cities and the Correlation with Economic Growth North Sumatera in 2010-2019

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ABSTRACT

This research is aimed to find out the level of regional disparity, the effects of government expenditure, natural resources, and the investment toward regional disparity among regencies/cities in North Sumatera Province, and the relationship between the inequality and economic growth of North Sumatera Province in 2010-2019. Using secondary data, the research applies Williamson index analysis technique to measure the development disparity. The panel regression analysis; Common Effect, Fixed Effect and Random Effect; is used to analyze the effects of government expenditure, investment, and natural resources toward regional disparity in North Sumatera in 2010-2019. This research also uses Product Moment Correlation and Regression Curve Estimation to find out the correlation between the disparity and economic growth. The result of the study shows that the level of regional disparity in North Sumatera Province is very high. Government expenditure, natural resources significantly affect the regional disparity, whereas the investment does not significantly affect the disparity. The correlation between the growth economy and regional disparity indicates a very weak negative correlation. Thus, the data cannot be used to explain the correlation between economy growth and development disparity in North Sumatera Province in 2010-2019.

Keywords: *Economy Growth, Regional Disparity*

1. INTRODUCTION

Disparity in economic development between regions is a common phenomenon that occurs in the economic development process of a region. The occurrence of development disparity between these regions has implications for the welfare of the community in the region concerned. Usually, the implications are in the form of jealousy and public dissatisfaction which can also continue with political implications and the peace of society [19].

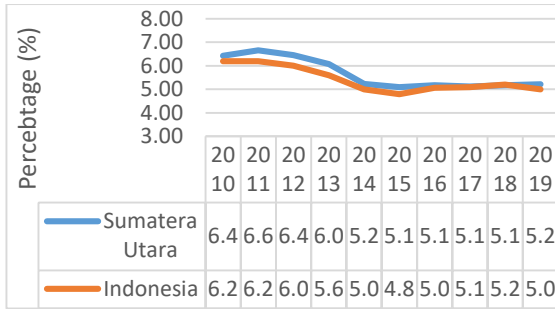
Regional disparity is a logical consequence of the development process and it will change in line with the changing levels of the development process itself. The patterns of development and the level of disparity in development in several countries are not the same, this is due to several different factors found in the countries, such as the ownership of resources, facilities, infrastructure, history of the countries, location and so on [20].

Economic growth has a significant negative effect on regional disparity. It means that if economic growth increases, regional disparity decreases and vice versa.

This indicates that economic growth is a necessary condition for regional development but it is not a sufficient condition. Because there are other factors that are very important, that is how the development will make local communities more prosperous by increasing community income.

For this reason, it is very important to carry out development in a planned and well directed way towards reducing regional disparity. Understanding thoroughly the problem of disparity needs to be a reference in the formulation of development planning, so that efforts to achieve equitable development in Indonesia can be achieved.

Regions with higher economic growth than other regions will face a new burden that is the poor areas in their vicinity will move to these areas. This occurs due to the attraction of more job opportunities in these urban areas. The problem that arises as a result of this is that population density can increase the unemployment rate because the available jobs are unable to employ the entire population [20].



Source : Central Bureau of Statistics (BPS) (various years of publication)

Figure 1. Economic Growth of North Sumatra Province and Provincial Average in Indonesia, 2010-2019

From the statistical data above, North Sumatra's economic growth since 2011 tended to decreased until 2015 and slightly increased in 2016. The economic growth of North Sumatra Province in 2010-2019 was relatively higher when compared to Indonesia's economic growth.

In the 2015-2019 National Medium-Term Development Plan (RPJMN), Book II on the Field Development Agenda, states that economic growth will increase sharply since 2016 which boosts economic growth in 2017 to reach 7.1 percent and continues to increase in 2018 and 2019 which are targeted to reach 7.5 percent and 8.0 percent, respectively. But in reality, in 2017 Indonesia's economic growth rate was only in the range of 5.1 percent and North Sumatra's economic growth was in the range of 5.12 and the target of 2015-2019 RPJMN economic growth in 2018 was only 5 percent.

[19] argues that the income distribution analysis looks at the disparity between groups of people, while the inequality of development between regions looks at differences in the level of development between regions. What is at issue here is not the difference between the rich and the poor, but between developed and underdeveloped regions.

In a study by [19], who first conducted a study on the size of development disparities between regions, the term Williamson Index emerged as a tool to measure development disparities between regions. The Williamson Index is used to see development disparities between regions by using the Gross Domestic Product (GRDP) per capita as the basic data.

GRDP per capita of regencies/cities in North Sumatra Province in the picture above shows an increasing trend from 2010 to 2019. PDRB per capita of Labuhan Batu District, Batubara District, Labuhan Batu Selatan District, North Labuhan Batu District, Sibolga City and Medan City exceeds the per capita GRDP of Sumatra Province.

Table 1 Regional GDP Per capita per District/City of the Province of North Sumatera in 2010 dan 2019

District/City	2010	2019
District Nias	3.887.995,00	17.883.380,85
District Mandailing Natal	5.017.866,00	20.962.971,93
District Tapanuli Selatan	5.761.855,00	34.347.618,14
District Tapanuli Tengah	3.850.869,00	18.648.164,53
District Tapanuli Utara	5.780.955,00	19.102.542,90
District Toba Samosir	10.176.988,00	29.966.805,00
District Labuhanbatu	7.857.113,00	47.012.833,83
District Asahan	8.065.320,00	35.962.477,21
District Simalungun	6.812.974,00	31.510.549,87
District Dairi	7.593.589,00	23.108.408,98
District Karo	9.594.214,00	34.568.495,81
District Deli Serdang	8.107.952,00	32.735.982,06
District Langkat	7.452.508,00	28.410.906,73
District Nias Selatan	4.251.105,00	13.194.782,00
District Humbang Hasundutan	5.864.032,00	21.773.933,27
District Pakpak Barat	4.070.571,00	17.416.968,84
District Samosir	8.846.290,00	24.556.541,89
District Serdang Bedagai	7.663.966,00	31.462.548,99
District Batubara	19.672.216,00	57.620.639,63
District Padang Lawas Utara	3.479.380,00	30.172.574,96
District Padang Lawas	3.356.540,00	28.300.859,48
District Labuhanbatu Selatan	10.212.617,00	55.313.131,96
District Labuhanbatu Utara	9.565.185,00	47.439.334,26
District Nias Utara	3.851.851,00	16.905.750,27
District Nias Barat	3.106.083,00	15.053.784,59
City Sibolga	8.759.806,00	40.745.042,24
City Tanjungbalai	9.043.279,00	33.045.712,63
City Pematangsiantar	8.687.762,00	37.646.293,76
City Tebing Tinggi	8.024.751,00	24.050.958,21
City Medan	17.077.622,00	68.766.609,71
City Binjai	8.209.884,00	29.405.725,65
City Padangsidempuan	4.887.204,00	19.210.085,98
City Gunungsitoli	6.877.659,00	24.071.792,96
SUMATERA UTARA	9.110.777,00	37.048.911,92

Source: Central Bureau of Statistics (BPS) (various years of publication)

Medan City has the largest per capita GRDP in North Sumatra Province of Rp. 68.766.609,71 in 2019 then followed by Batubara District in the amount of Rp. 57.620.639.63, while the GRDP per capita of North Sumatra Province is Rp. 37.048,911,92. Batubara District has contributed to the increase in GRDP from PT. Inalum originates from the distribution of net income to local revenue or sharing of tax revenues. The figure also shows that the GRDP per capita figures of regencies and cities are still much below the GRDP per capita figure of North Sumatra Province. The existence of this per capita GRDP variation indicates the occurrence of income inequality between regencies/cities in North Sumatra Province.

According to [19], economic inequality between regions is a common aspect of economic activity in a region. This imbalance is basically caused by differences in the content of natural resources and differences in demographic conditions in each region.

Policy on the distribution of government spending that is right on target and the right direction of investment to areas that can create job opportunities will increase economic growth, but if the distribution cannot be carried out evenly, the income disparity of regencies/cities will still happen and tend to increase and no longer provide room for communities, especially low-income earners, to take part in the development process.

The foreign investment has a positive effect on the level of development inequality. Uneven foreign investment between regions causes development inequality. Government spending on development has a negative effect on development inequality in Banten Province. This means that an increase in government spending for development can reduce the level of inequality that occurs. Meanwhile, the unemployment rate has no effect on development inequality in Banten Province. This is due to the relatively small unemployment rate in Banten Province.

Another indicator that shows a pattern of inequality is the distribution of investment, both from foreign and domestic sources. Based on the Harrod-Domar growth theory, which basically believes that the rate of economic growth is highly dependent on the level of investment: The higher the level of investment, the higher the rate of economic growth achieved.

One of the most classic theories regarding the growth of inequality is what economists call the Kuznets curve. The famous economist Simon Kuznets argues that as developing countries grow, disparity grows as well, due to less high-waif assets - landowners, for example - the benefits of ownership of productive resources. Then as industrialization developed, a much larger portion of the population had the opportunity to participate in jobs that added higher value, which reduced inequality. The result is an inverted U-shaped curve with inequality on the y-axis and per-capita income on the x-axis. As income grows, the distribution initially becomes more evenly distributed, but as the productivity benefits become broader together, inequality decreases. As explained above, the desired development is to achieve high levels of economic growth with equity.

The economic growth of North Sumatra Province in 2010-2019 was relatively higher than the average economic growth of provinces in Indonesia. The high concentration of economic activity in a region will allow the problem of inequality to arise. The basic problem in North Sumatra Province is that there are still many regencies/cities that have a GRDP per capita below the province, even between regencies/cities themselves, there are differences in the level of PDRB per capita which illustrates the imbalance between regions in North Sumatra Province.

From the above, inequality in the North Sumatra Region has been ongoing and takes many forms, aspects or dimensions. The existence of imbalances in development between regencies/cities in North Sumatra can be caused by various obstacles, both in terms of APBD or regional learning, investment, and different potential natural resources owned by each District/city. The aim is to analyze the factors that cause disparity between regions. Thus, it can provide input to the government in making appropriate efforts, to improve the welfare of all the people of North Sumatra Province.

2. RESEARCH METHOD

The approach used in this research is a quantitative approach. The reason the researcher uses a quantitative approach is because the researcher intends to eliminate subjectivity in research.

In this study, the Williamson Index was selected because it allows to make comparisons over a period of time and to see the trend of inequality patterns in North Sumatra in the 2010-2019 period. Economic inequality is measured using indicators of per capita GRDP developments. The way to calculate the Williamson index can be done [19]:

$$V_w = \frac{\sqrt{\sum_{i=1}^n (y_i - \bar{y})^2 (f_i/n)}}{\bar{y}} \quad 0 < V_w < 1 \quad (1)$$

where:

- V_w = Williamson coefficient of variation (Williamson Index);
- Y_i = GRDP per capita regencies/cities in North Sumatra Province;
- Y = GRDP Per Capita of North Sumatra Province;
- f_i = Total population of regencies/cities in North Sumatra Province;
- n = Total Population in North Sumatra Province.

The index of economic development disparity is indicated by the numbers 0 to 1 or $0 < V_w < 1$. The closer to 0, the lower the disparity and the closer to 1 the disparity is getting bigger.

Furthermore, to see the effect of government spending, investment, and natural resources on disparity, multiple regression is used as in the equation:

$$V_{wit} = \beta_0 + \beta_1 \log X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \mu_{it} \quad (2)$$

where:

- V_w = Williamson Index of North Sumatra Province;
- X_1 = District/City APBD expenditures in North Sumatra (Rp);
- X_2 = Revenue sharing funds from natural resources to the total regional revenue of each District/city in North Sumatra (Rp);
- X_3 = The level of investment on the GRDP of each district / city in North Sumatra (Rp);
- β_0 = constant;
- $\beta_1, \beta_2, \beta_3$ = the respective coefficients of X_1, X_2, X_3 ;
- t = year;
- μ = distraction factor.

The next analysis method is panel data regression using Eviews 9. This analysis method is used to determine the significance of government expenditure variables, natural resources, and investment on the level

of inequality in regencies/cities in North Sumatra Province. The results of data processing will be displayed in tabular form.

Regression using panel data is called a panel data regression model. To analyze the effect of government spending, investment, and natural resources on regional inequality in North Sumatra for the 2010-2019 period, it can be seen by using 3 (three) analysis methods used to estimate the regression model with panel data, namely Common Effect, Fixed Effect and Random.

To see the relationship between regional inequality and economic growth, the Pearson Correlation Coefficient is used.

$$r = \frac{n \sum XY - \sum X \sum Y}{\sqrt{(n \sum X^2 - (\sum X)^2)(n \sum Y^2 - (\sum Y)^2)}} \tag{3}$$

where:

- r = correlation value;
- x = variable x;
- y = variable y.

3. RESULTS AND DISCUSSION

Approach models that can be used to obtain panel data regression estimates from the above equation are Common Effect Model (CEM), Fixed Effect Model (REM) and Random Effect Model (REM).

By using the statistical application Eviews 9 performs the Chow Test to choose the best model between CEM and FEM, and the best is CEM. Furthermore, the Lagrange Multiplier (LM) test is carried out to choose the best between CEM and REM, the estimation results of REM are better.

One of the things that can be done to deal with multicollinearity is to do nothing, because multicollinearity is basically a data deficiency problem and sometimes, we don't have a choice of data available for empirical analysis.

Equations that meet classical assumptions are only equations that use the Generalized Least Square (GLS) method. In the eviews, the estimation model using the GLS method is only a random effect model, while the fixed effect and common effect use the Ordinary Least Square (OLS). Thus whether or not classic assumptions are tested in this study depends on the results of selecting the estimation method. If based on the selection of the appropriate estimation method for the regression equation is random effect, it is not necessary to test the classical assumptions.

Table 2: Estimation Results of the Model Parameters of Inequality between Regencies/Cities

No	Variable	Coefficient	t-Statistic	Prob.
1.	Constant	0.004390	0.155329	0.8767
2.	Government Expenditure (x1)	0.169138	5.270046	0.0000
3.	DBH SDA (x2)	4.950477	2.788495	0.0056
4.	Investation (x3)	-0.017515	2.127327	0.0341
adjusted R ²		= 0.142608		
F-statistic		= 19.24054		
Prob(F-Statistic)		= 0.000000		

Source: Author's Calculation Results

From the estimation results of the model parameter of inequality between districts / cities, the coefficient value for each variable in the study is obtained, so that it can be translated into the following equation:

$$IW = 0,004390 + 0,169138 PP + 4,950477 DBH SDA - 0,017515 INV + ut \tag{3}$$

The intercept or constant value of 0.004390 states that if the variable value of Government Expenditures, Natural Resources Sharing Funds and Investment is zero, then the level of inequality in regencies/cities in North Sumatra Province will be 0.004390. The adjusted R2 value in Table 4.5 of 0.14 states that about 14 percent of the total variation in the level of disparity can be explained by Government Expenditures, Natural Resources Sharing Funds and Investment. Meanwhile, the remaining 86 percent is explained by other variables outside the model.

Statistically, the Government Expenditure variable has a significant effect on inequality in North Sumatra Province. In general, government spending has a positive effect on inequality. This means that greater government spending causes an increase in the level of disparity.

Statistically, the variable of revenue sharing from natural resources has a significant effect on inequality in North Sumatra Province. In general, revenue sharing from natural resources from natural resources has a positive effect on disparity. This means that the increase in income originating from the allocation of funds for the results of natural resources causes an increase in the level of inequality. The results of this analysis contradict the research conducted by [12], researching that in developing countries, abundant natural resources, especially oil and minerals, will reduce the level of disparity, but disparity will increase again in the long term if the available SDA decreases. The insignificant result is possible because the SDA produced by each District/city is relatively evenly distributed, namely from forestry. Langkat District is a producer of oil and natural gas.

The investment coefficient of -0.017515 states that assuming the effect of Government Expenditures, Natural Resource Sharing Funds is constant, every 1

percent increase in investment causes a decrease in the level of inequality by 1.7 percent. This is not in line with Kuznets' hypothesis which assumes that the high income group contributes large capital and savings while the capital from other groups is very small. Thus the difference in the ability to save will affect the concentration of increasing the proportion of income in the high income groups. This process will have an accumulative impact, which will further increase the capacity of higher income groups, and in turn will increase the income gap in a region. This research is also not in line with Myrdal's theory [1] which states that the transfer of capital will in fact cause disparity or a backwash effect. In developing regions the demand for goods/services will encourage investment to increase thereby increasing income. On the other hand, in less developed regions, the demand for investment is low due to low incomes.

By using calculations from Excel, you can get the Pearson Correlation Coefficient -0.10558, which means that there is a very weak negative correlation between regional inequality in districts/cities in North Sumatra with economic growth in North Sumatra. The two variables have a negative relationship direction (the higher the economic growth, the lower the Williamson index number) and are not significant. The size of the relationship between economic growth and the Williamson index can be classified as very weak, so it cannot be used to explain the relationship between economic growth and development disparity in North Sumatra Province during 2010-2019.

4. CONCLUSIONS AND SUGGESTIONS

Conclusion

- a. Regional disparity in North Sumatra Province is at a high level of disparity. From 2010 to 2019, the Williamson Index always shows numbers above $IW > 0.5$. Thus, the government's objective in equitable development and economy for the last 10 years is still far from expected.
- b. Regional disparities in regencies/cities varied considerably during the 2010-2019 period. This is due to a significant influence on Government Expenditure, regions with large APBD will affect the gap with other regions that have APBD that are far below it.
- c. The amount of regional revenue from the Natural Resources Revenue Sharing Fund also affects the level of disparity in the North Sumatra region. In general, revenue sharing from natural resources from natural resources has a positive effect on disparity. This means that the increase in income originating from the allocation of funds for the results of natural resources causes an increase in the level of disparity.
- d. The investment variable does not have a significant effect on disparity in regencies/cities in the province of North Sumatra, that the amount of investment obtained by one region will not affect other regions.

The greater the credit disbursed by financial institutions for investment purposes, the more it will not affect the level of disparity.

- e. There is a very weak negative correlation between economic growth and regional disparity. Thus, it cannot be used to explain the relationship between economic growth and development disparity in North Sumatra Province during 2010-2019.

Suggestion

- a. The author realizes that there are many deficiencies in the writing of this thesis. The limitation of the researcher is the use of investment variable data. The investment data needed by researchers should be PMA and PMDN investments in each District/city. However, the researchers were unable to find this data in BPS or in related institutions. The researcher was also unable to examine the accuracy of the Williamson index data issued by Bank Indonesia and could not see the basic calculation.
- b. In determining regional policies, local governments must be able to pay attention to aspects of inequality between regions.
- c. Local governments should further increase the direct expenditure allocation, considering that direct expenditure affects regional economic development.

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